

Rao, R., D. Sloman, Q.M. Ketterings, and H. Krol (2007). Otsego Soil Sample Survey 2002-2006. CSS Extension Bulletin E07-52. 29 pages.

Soil Sample Survey

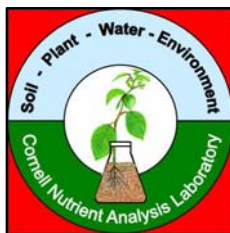
Otsego County

Samples analyzed by CNAL in 2002-2006



Summary compiled by

Renuka Rao, Dinnie Sloman, Quirine M. Ketterings, and Hettie Krol



Cornell Nutrient Analysis Laboratory
<http://www.css.cornell.edu/soiltest/newindex.asp>

&

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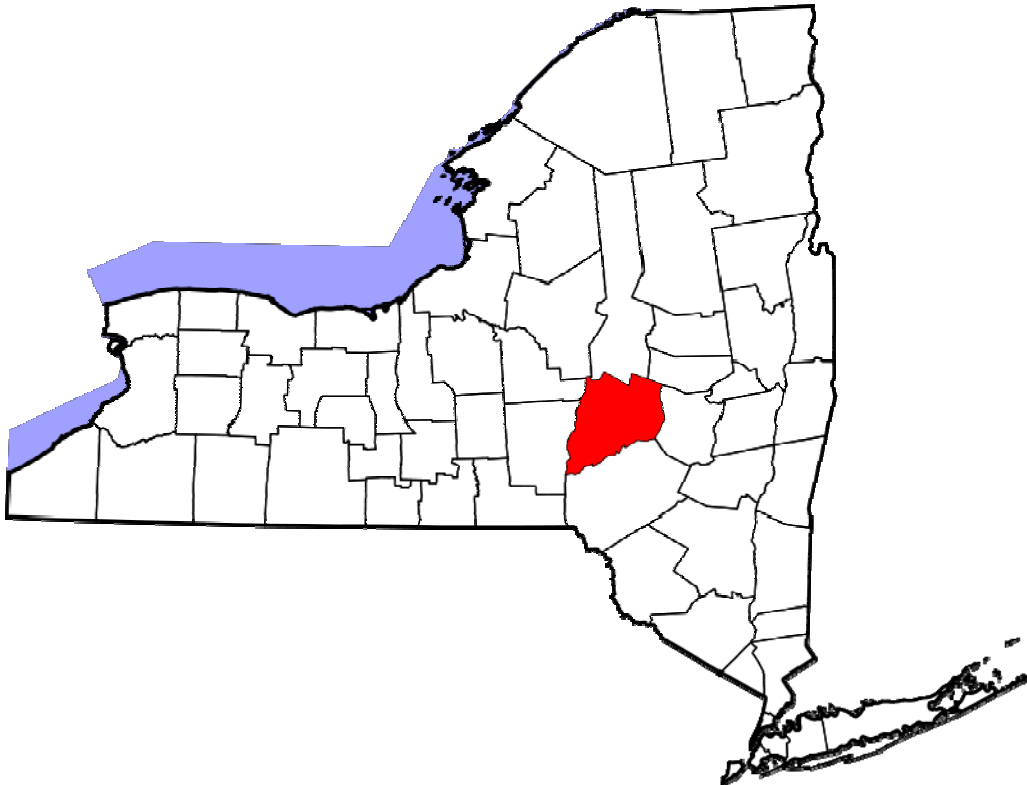


1. County Introduction

Otsego County is in central New York State, to the west of Albany, southeast of Utica, and northeast of Binghamton.

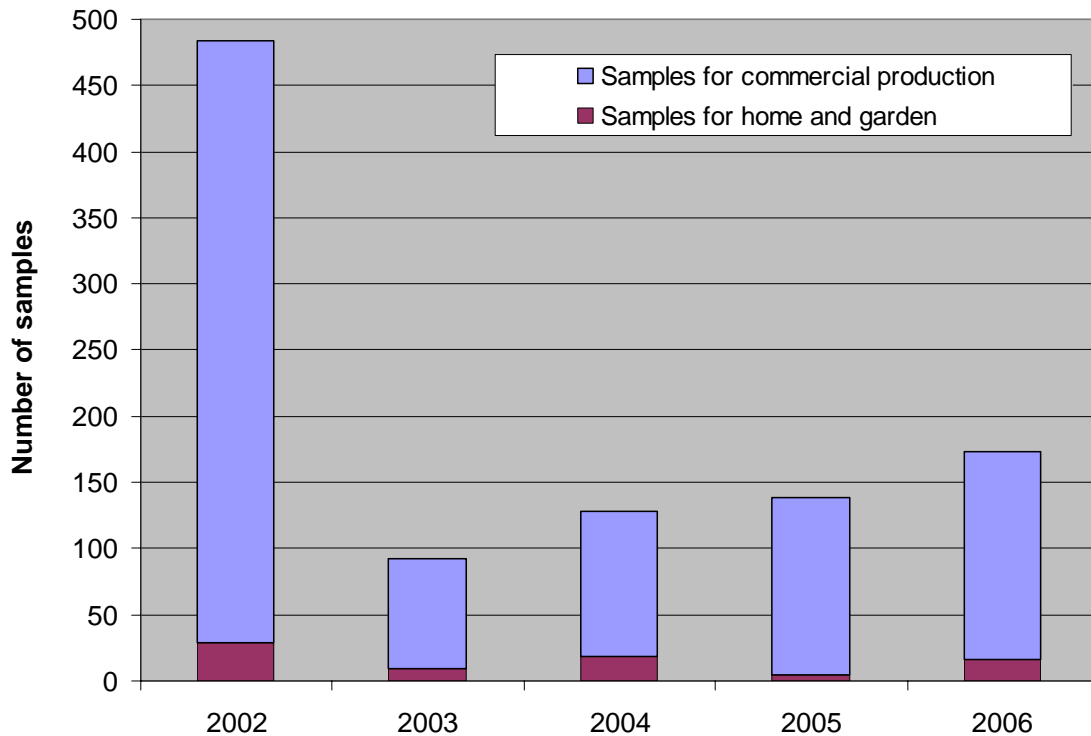
The New York Agricultural Statistics Service reports that in 2003, there were 205,900 acres (32% of the total acreage) in farms. There were 1,020 farms in the county averaging 202 acres per farm. Otsego County ranked 7th in the state for number of farms and 9th for land in farms in 2003.

In 2002 the market value of all agricultural products sold from county farms was \$50.7 million and total sales averaged \$49,322 per farm (2002 Census of Agriculture). The leading products sold were: dairy products, cattle and calves, hay and other crops, nursery and greenhouse, and grains and dry beans.



1. General Survey Summary

This survey summarizes the soil test results from grower (identified as “commercial samples”) and homeowner samples from Otsego County submitted to the Cornell Nutrient Analysis Laboratory (CNAL) during 2002 and 2006. The total number of samples analyzed in these years amounted to 1024. Of these 937 samples (92%) were submitted by commercial growers while 78 samples (8%) were submitted by homeowners.



Homeowners		Commercial		Total
2002	29	2002	455	484
2003	9	2003	83	101
2004	19	2004	109	128
2005	5	2005	133	138
<u>2006</u>	<u>16</u>	<u>2006</u>	<u>157</u>	<u>173</u>
Total	78	Total	937	1024

Homeowners submitted soil samples to the Cornell Nutrient Analysis Laboratory during 2002-2006 primarily to request fertilizer recommendations for home garden vegetable production (26%), and lawns (18%). Commercial growers submitted samples primarily to grow corn silage or grain (30%), grass for hay production (27%), and alfalfa mixes (23%).

Soils tested for home and garden in Otsego County were classified as belonging to soil management group 2 (28%), group 3 (32%), group 4 (32%), or group 5 (8%). A description of the different management groups is given below.

Soil Management Groups for New York

1	Fine-textured soils developed from clayey lake sediments and medium- to fine-textured soils developed from lake sediments.
2	Medium- to fine-textured soils developed from calcareous glacial till and medium-textured to moderately fine-textured soils developed from slightly calcareous glacial till mixed with shale and medium-textured soils developed in recent alluvium.
3	Moderately coarse textured soil developed from glacial outwash and recent alluvium and medium-textured acid soil developed on glacial till.
4	Coarse- to medium-textured soils formed from glacial till or glacial outwash.
5	Coarse- to very coarse-textured soils formed from gravelly or sandy glacial outwash or glacial lake beach ridges or deltas.
6	Organic or muck soils with more than 80% organic matter.

Of the samples submitted by commercial growers, 77% belonged to soil management group 3. There were 4 samples that belonged to group 5 and one sample each of group 1 and 6 soils. Two percent belonged to group 4 while 22% were group 2 soils. Chenango was the most common soil series (25% of all samples), followed by Mardin and Lansing (9% each), Lordstown (6%) and Valois (5%).

Organic matter levels, as measured by loss-on-ignition, ranged from less than 1% to almost 50% (more likely an organic soil although the soil type of this samples was not identified). For homeowner samples, 11% had less than 3% organic matter, 17% had between 3 and 4% organic matter, and the remaining 73% had more than 4% organic matter. Of the samples submitted by commercial growers, 22% contained less than 4%

organic matter, 63% had between 4 and 6% organic matter, while the rest of the samples had more than 6% organic matter.

Soil pH in water (1:1 soil:water extraction ratio) varied from 4.1 to 8.1 for home and garden samples while 62% tested between pH 6.0 and 7.4. For the commercial samples, the highest pH was 7.9, 62% tested between 6.0 and 7.4 while 37% had a pH less than 6.0.

Extractable nutrients such as phosphorus (P), potassium (K), magnesium (Mg), calcium (Ca), iron (Fe), manganese (Mn), and zinc (Zn) were measured using the Morgan method (Morgan, 1941). This solution contains sodium acetate buffered at pH of 4.8.

Soil test P levels of <1 lb P/acre are classified as very low. Between 1-3 lbs P/acre is low. Medium is between 4-8 lbs P/acre. High testing soils have P levels between 9 and 39 lbs P/acre and anything higher is classified as very high. For homeowners, 17% of the soils tested low for P, 17% tested medium, 38% tested high and 28% tested very high. This meant that 66% tested high or very high in P. For commercial growers, 6% tested very high. In total 31% were low in P, 27% tested medium for P while 36% of the submitted samples were classified as high in soil test P. This means that 42% tested high or very high in P.

Classifications for K depend on soil management group. The fine textured soils (soil management group 1) have a greater K supplying capacity than the coarse textured sandy soils (soil management group 5). Classification for each of the management groups in the above table represent very low, low, medium, high and very high. So for example for soil management group 5 and 6, <60 lbs K/acre means the soil is very low in K, between 60 and 114 lbs K/acre is medium, 115-164 lbs K/acre is medium, 165-269 lbs K/acre is high and >269 lbs K/acre is classified as very high (see Table on page 5).

Potassium classifications for Otsego County soils varied from very low (1% of the commercial growers' soils) to very high (60% of the homeowner soils and 49% of the commercial growers' soils). For homeowners, 10% tested low in K, 5% tested medium, and 24% tested high for potassium. For commercial growers' soils, 8% tested low, 17% tested medium and 26% tested high in K and the remainder was of unknown soil series and could therefore not be classified for K.

Soil Management Group	Potassium Soil Test Value (Morgan extraction in lbs K/acre)				
	Very low	Low	Medium	High	Very High
1	<35	35-64	65-94	95-149	>149
2	<40	40-69	70-99	100-164	>164
3	<45	45-79	80-119	120-199	>199
4	<55	55-99	100-149	150-239	>239
5 and 6	<60	60-114	115-164	165-269	>269

Soils test very low for Mg if Morgan extractable Mg is less than 20 lbs Mg/acre. Low testing soils have 20-65 lbs Morgan Mg per acre. Soils with 66-100 lbs Mg/acre test medium for Mg. High testing soils have 101-199 lbs Mg/acre while soils with more than 200 lbs Mg/acre in the Morgan extraction are classified as very high in Mg. Magnesium levels ranged from 33 to more than 1500 lbs Mg/acre. There were no samples that tested very low for Mg. Most soils tested high or very high for Mg (95% of the homeowner soils and 94% of the soils of the commercial growers).

Soils with more than 50 lbs Morgan extractable Fe per acre test excessive for Fe. Anything lower than 50 lbs Fe/acre is considered normal. Iron levels ranged from 88-95% in the normal range with 12% of the homeowner soils and 5% of the commercial grower soils testing excessive for Fe. Similarly, 91-99% tested normal for manganese. Soils with more than 100 lbs Morgan extractable Mn per acre are classified as excessive in Mn. Anything less than 100 lbs Mn per acre is classified as normal. Soils with less than 0.5 lb Zn per acre in the Morgan extraction are classified as low in Zn. Medium testing soils have between 0.5 and 1 lb of Morgan extractable Zn per acre. If more than 1 lb of Zn/acre is extracted with the Morgan solution, the soil tests high in Zn. For the homeowner soils, 85% tested high for Zn while 10% tested medium and 5% were low in Zn. Of the commercial growers' samples, 6% tested low, 18% tested medium while 76% were high in Zn.

In the following sections, the summary tables for each of the soil fertility indicators described above are given. The appendix contains the crop codes used in section 3.

2. Cropping Systems

2.1 Homeowner Samples

Crops for which recommendations are requested by homeowners:

	2002-2006	%
APR	1	1
ATF	8	10
FLA	1	1
GRA	2	3
LAW	14	18
LET	1	1
MIX	1	1
MVG	20	26
OTH	11	14
RSP	1	1
SAG	10	13
TRF	4	5
Unknown	4	5
Total	78	100

See Appendix for Cornell crop codes.

2.2 Commercial Samples

Crops for which recommendations are requested in commercial samples:

Current year crop	2002	2003	2004	2005	2006	Total	%
ABE/ABT	7	2	0	0	0	9	1
AGE/AGT	77	11	26	35	20	169	18
ALE/ALT	14	0	1	1	21	37	4
APP	0	0	1	2	0	3	0
ASP	1	0	0	0	0	1	0
BGT	0	0	0	0	1	1	0
BLB	0	0	1	0	0	1	0
BRP	0	0	0	1	0	1	0
BSP	0	0	0	0	1	1	0
BSS	1	0	0	0	0	1	0
BUK	1	0	0	0	0	1	0
CBS	0	0	0	0	1	1	0
CFP	0	0	0	0	1	1	0
CGE/CGT	2	1	0	10	4	17	2
CLE/CLT	2	0	0	1	2	5	1
COG/COS	120	25	52	30	50	277	30
CUR	0	0	0	0	1	1	0
GIE/GIT	100	8	1	17	10	136	15
GPF	0	1	0	0	0	1	0
GRE/GRT	73	8	15	11	5	112	12
IDL	6	0	0	4	8	18	2
LET	0	0	0	2	1	3	0
MVG	0	2	0	0	0	2	0
OAS	4	0	0	1	0	5	1
OAT	10	3	1	5	4	23	2
PGE/PGT	6	1	0	1	1	9	1
PIE/PIT	11	2	1	1	4	19	2
PLT	0	0	0	1	0	1	0
PNT	10	5	0	4	6	25	3
PUM	0	2	3	1	0	6	1
SOY	0	1	2	1	7	11	1
SQS	1	0	0	0	0	1	0
SWC	0	0	0	4	1	5	1
TOM	0	0	0	0	1	1	0
TRP	5	2	0	0	0	7	1
WHT	0	1	0	0	1	2	0
Unknown	4	8	5	0	6	23	3
Total	455	83	109	133	157	937	100

3. Soil Types

3.1 Homeowner Samples

Soil types (soil management groups) for homeowner samples:

	2002-2006	%
SMG 1 (clayey)	0	0
SMG 2 (silty)	22	28
SMG 3 (silt loam)	25	32
SMG 4 (sandy loam)	25	32
SMG 5 (sandy)	6	8
SMG 6 (mucky)	0	0
Total	78	100

3.2 Commercial Samples

Soil series for commercial samples:

Name	SMG	2002	2003	2004	2005	2006	Total	%
Adams	5	0	0	0	2	0	2	0
Atherton	3	1	0	0	0	0	1	0
Bath	3	32	1	5	2	0	40	4
Canandaigua	3	1	0	0	0	0	1	0
Castile	4	4	0	0	3	1	8	1
Champlain	5	2	0	0	0	0	2	0
Chenango	3	64	14	55	30	77	240	25
Chippewa	3	0	0	0	0	3	3	0
Conesus	2	12	2	0	1	7	22	2
Danley	2	0	1	0	0	0	1	0
Farmington	3	1	0	0	2	0	3	0
Greene	3	6	0	0	1	0	7	1
Hamlin	2	5	0	1	1	1	8	1
Hamplain	2	2	0	0	0	0	2	0
Herkimer	3	8	0	1	4	4	17	2
Honeoye	2	5	3	0	2	1	11	1
Howard	3	21	1	8	3	1	34	4
Lackawanna	3	0	4	0	1	0	5	1
Lansing	2	54	14	0	1	16	85	9
Lewbath	3	5	0	0	1	0	6	1
Lima	2	2	0	0	7	0	9	1
Lordstown	3	40	4	0	9	2	55	6
Madalin	1	0	0	0	1	0	1	0
Manheim	2	6	0	0	3	2	11	1
Manlius	3	1	0	0	0	1	2	0
Mardin	3	54	12	11	7	4	88	9
Markey	6	0	0	1	0	0	1	0
Middlebury	3	3	0	3	2	0	8	1
Mongaup	3	5	2	3	14	1	25	3
Morris	3	1	0	0	0	1	2	0
Ontusia	3	0	0	0	3	0	3	0
Oquaga	3	0	0	0	0	1	1	0
Otego	2	5	0	6	3	4	18	2
Patchin	3	1	0	0	0	0	1	0
Phelps	3	2	0	0	0	0	2	0
Raynham	3	6	0	0	1	1	8	1

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Name	SMG	2002	2003	2004	2005	2006	Total	%
Red Hook	4	0	1	0	0	0	1	0
Rhinebeck	2	0	0	2	2	0	4	0
Riverhead	4	6	0	1	0	0	7	1
Scio	3	19	2	5	4	8	38	4
Teel	2	8	0	0	0	0	8	1
Tioga	3	1	0	1	4	0	6	1
Trestle	3	1	2	0	0	0	3	0
Unadilla	3	2	0	3	0	6	11	1
Valois	3	29	6	3	3	7	48	5
Volusia	3	12	2	0	0	0	14	1
Wakeville	3	10	2	0	5	2	19	2
Wassaic	4	1	1	0	1	0	3	0
Wayland	2	4	0	0	0	3	7	1
Wellsboro	3	2	0	0	3	3	8	1
Willdin	3	11	0	0	7	0	18	2
Unknown	0	0	9	0	0	0	9	1
Total	150	455	83	109	133	157	937	100

4. Organic Matter

4.1 Homeowner Samples

Organic matter (loss-on-ignition method) in homeowner samples (number):

	<1	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	>6.9	Total
Number	1	1	7	13	13	14	9	20	78
Percentage	1	1	9	17	17	18	12	26	100

	2002-2006
Lowest:	0.9
Highest:	14.6
Mean:	5.7
Median:	5.2

4.2 Commercial Samples

Organic matter (loss-on-ignition method) in commercial samples (number):

	<1	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	>6.9	Total
2002	0	0	17	64	153	156	54	11	455
2003	0	1	3	12	20	31	10	6	83
2004	0	0	11	22	30	35	9	2	109
2005	0	0	10	30	28	33	22	10	133
2006	0	0	12	20	56	44	14	11	157
Total	0	1	53	148	287	299	109	40	937

	2002	2003	2004	2005	2006
Lowest:	2.0	1.9	2.3	2.1	2.3
Highest:	9.4	8.0	9.6	8.3	46.2
Mean:	4.9	5.0	4.6	4.9	5.2
Median:	4.9	5.1	4.5	4.8	4.7

Organic matter commercial samples (% of total number of samples):

	<1	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	>6.9	Total
2002	0	0	4	14	34	34	12	2	100
2003	0	1	4	14	24	37	12	7	100
2004	0	0	10	20	28	32	8	2	100
2005	0	0	8	23	21	25	17	8	100
2006	0	0	8	13	36	28	9	7	100
Total	0	0	6	16	31	32	12	4	100

5. pH

5.1 Homeowner Samples

pH of homeowner samples (numbers):

	<4.5	4.5-4.9	5.0-5.4	5.5-5.9	6.0-6.4	6.5-6.9	7.0-7.4	7.5-7.9	8.0-8.4	>8.4	Total
Total	3	2	8	12	13	18	17	4	1	0	78
Total	4	3	10	15	17	23	22	5	1	0	100

	2002-2006
Lowest:	4.1
Highest:	8.1
Mean:	-
Median:	6.5

5.2 Commercial Samples

pH of commercial samples (number):

	<4.5	4.5-4.9	5.0-5.4	5.5-5.9	6.0-6.4	6.5-6.9	7.0-7.4	7.5-7.9	8.0-8.4	>8.4	?	Total
2002	1	5	43	154	157	80	14	1	0	0	0	455
2003	0	0	6	14	32	25	3	2	0	0	1	83
2004	0	0	1	10	51	40	5	0	0	0	2	109
2005	0	1	18	44	52	15	3	0	0	0	0	133
2006	0	2	17	34	71	27	6	0	0	0	0	157
Total	1	8	85	256	363	187	31	3	0	0	3	937

	2002	2003	2004	2005	2006
Lowest:	4.3	5.1	5.3	4.9	4.5
Highest:	7.9	7.6	7.3	7.1	7.4
Mean:	-	-	-	-	-
Median:	6.0	6.2	6.4	6.0	6.1

pH of commercial samples (% of total amount of samples):

	<4.5	4.5-4.9	5.0-5.4	5.5-5.9	6.0-6.4	6.5-6.9	7.0-7.4	7.5-7.9	8.0-8.4	>8.4	?	Total
2002	0	1	9	34	35	18	3	0	0	0	0	100
2003	0	0	7	17	39	30	4	2	0	0	1	100
2004	0	0	1	9	47	37	5	0	0	0	2	100
2005	0	1	14	33	39	11	2	0	0	0	0	100
2006	0	1	11	22	45	17	4	0	0	0	0	100
Total	0	1	9	27	39	20	3	0	0	0	0	100

6. Phosphorus

6.1 Homeowner Samples

Phosphorus (lbs/acre Morgan P) in homeowner samples (numbers):

	<1	1-3	4-8	9-39	40-60	61-80	81-100	101-150	151-200	>200	Total
	VL	L	M	H	VH	VH	VH	VH	VH	VH	
Total	0	13	13	30	9	1	4	4	1	3	78
Total	0	17	17	38	12	1	5	5	1	4	100

VL = very low, L = low, M = medium, H = high, VH = very high.

	2002-2006
Lowest:	1
Highest:	752
Mean:	49
Median:	18

6.2 Commercial Samples

Phosphorus (lbs P/acre Morgan extraction) for commercial samples (number):

	<1	1-3	4-8	9-39	40-60	61-80	81-100	101-150	151-200	>200	Total
	VL	L	M	H	VH	VH	VH	VH	VH	VH	
2002	0	170	126	142	11	4	2	0	0	0	455
2003	0	31	26	18	6	1	0	0	0	1	83
2004	0	10	28	65	4	2	0	0	0	0	109
2005	0	50	34	39	6	2	1	1	0	0	133
2006	0	32	35	75	11	2	2	0	0	0	157
Total	0	293	249	339	38	11	5	1	0	1	937

VL = very low, L = low, M = medium, H = high, VH = very high.

	2002	2003	2004	2005	2006
Lowest:	1	1	1	1	1
Highest:	87	522	101	94	94
Mean:	10	16	17	12	16
Median:	6	6	12	5	10

Phosphorus in commercial samples (% of total amount of samples):

	<1	1-3	4-8	9-39	40-60	61-80	81-100	101-150	151-200	>200	Total
	VL	L	M	H	VH	VH	VH	VH	VH	VH	
2002	0	37	28	31	2	1	0	0	0	0	100
2003	0	37	31	22	7	1	0	0	0	1	100
2004	0	9	26	60	4	2	0	0	0	0	100
2005	0	38	26	29	5	2	1	1	0	0	100
2006	0	20	22	48	7	1	1	0	0	0	100
Total	0	31	27	36	4	1	1	0	0	0	100

VL = very low, L = low, M = medium, H = high, VH = very high.

7. Potassium

7.1 Homeowner Samples

Potassium (lbs K/acre Morgan extraction) in homeowner samples (number):

Soil Management Group 1						
	<35	35-64	65-94	95-149	>149	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	0	0	0	0
Total (%)	-	-	-	-	-	-
Soil Management Group 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	4	0	2	16	22
Total (%)	0	18	0	9	73	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	3	2	5	15	25
Total (%)	0	12	8	20	60	100
Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	1	0	9	15	25
Total (%)	0	4	0	36	60	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	2	3	1	6
Total (%)	0	0	33	50	17	100
Soil Management Group 6						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
Total (#)	0	0	0	0	0	0
Total (%)	-	-	-	-	-	-

Potassium classification summary for homeowners:

Summary (#)	Very Low	Low	Medium	High	Very High	Total
Number	0	8	4	19	47	78
Percentage	0	10	5	24	60	100

	2002-2006
Lowest:	50
Highest:	1474
Mean:	330
Median:	272

7.2 Commercial Samples

Potassium (lbs K/acre Morgan extraction) in commercial samples (number):

Soil Management Group 1						
	<35	35-64	65-94	95-149	>149	Total
	Very Low	Low	Medium	High	Very High	
2002	0	0	0	0	0	0
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	1	0	0	0	1
2006	0	0	0	0	0	0
Total (#)	0	1	0	0	0	1
Total (%)	0	100	0	0	0	100
Soil Management Group 2						
	<40	40-69	70-99	100-164	>164	Total
	Very Low	Low	Medium	High	Very High	
2002	1	9	21	30	42	103
2003	0	1	4	11	4	20
2004	0	0	1	3	5	9
2005	0	3	0	2	15	20
2006	0	0	8	10	16	34
Total (#)	1	13	34	56	82	186
Total (%)	1	7	18	30	44	100
Soil Management Group 3						
	<45	45-79	80-119	120-199	>199	Total
	Very Low	Low	Medium	High	Very High	
2002	2	38	70	74	155	339
2003	0	6	9	11	26	52
2004	2	7	7	16	66	98
2005	0	2	23	38	43	106
2006	0	2	11	36	73	122
Total (#)	4	55	120	175	363	717
Total (%)	1	8	17	24	51	100

Soil Management Group 4						
	<55	55-99	100-149	150-239	>239	Total
	Very Low	Low	Medium	High	Very High	
2002	0	2	2	2	5	11
2003	0	0	0	0	2	2
2004	0	0	0	1	0	1
2005	0	0	1	2	1	4
2006	0	0	0	1	0	1
Total (#)	0	2	3	6	8	19
Total (%)	0	11	16	32	42	100
Soil Management Group 5						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
2002	0	0	1	1	0	2
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	1	1	2
2006	0	0	0	0	0	0
Total (#)	0	0	1	2	1	4
Total (%)	0	0	25	50	25	100
Soil Management Group 6						
	<60	60-114	115-164	165-269	>269	Total
	Very Low	Low	Medium	High	Very High	
2002	0	0	0	0	0	0
2003	0	0	0	0	0	0
2004	0	0	0	0	1	1
2005	0	0	0	0	0	0
2006	0	0	0	0	0	0
Total (#)	0	0	0	0	1	1
Total (%)	0	0	0	0	100	100

Potassium classification summary for commercial samples.

Summary (#)	Very Low	Low	Medium	High	Very High	?	Total
2002	3	49	94	107	202	0	455
2003	0	7	13	22	32	9	83
2004	2	7	8	20	72	0	83
2005	0	6	24	43	60	0	133
2006	0	2	19	47	89	0	157
Grand Total	5	71	158	239	455	9	937

Summary (%)	Very Low	Low	Medium	High	Very High	?	Total
2002	1	11	21	24	44	0	100
2003	0	8	16	27	39	11	100
2004	2	6	7	18	66	0	100
2005	0	5	18	32	45	0	100
2006	0	1	12	30	57	0	100
Grand Total	1	8	17	26	49	1	100

	2002	2003	2004	2005	2006
Lowest:	38	48	29	54	67
Highest:	1213	807	933	1131	985
Mean:	218	248	317	236	269
Median:	165	172	258	179	222

8. Magnesium

8.1 Homeowner Samples

Magnesium (lbs Mg/acre Morgan extraction) in homeowner samples (numbers):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
Total	0	2	2	16	58	78
Total	0	3	3	21	74	100

	2002-2006
Lowest:	33
Highest:	1560
Mean:	347
Median:	295

8.2 Commercial Samples

Magnesium (lbs Mg/acre Morgan extraction) in commercial samples (number):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
2002	0	4	26	121	304	455
2003	0	0	4	16	63	83
2004	0	2	3	16	88	109
2005	0	0	7	28	98	133
2006	0	2	7	43	105	157
Total	0	8	47	224	658	937

	2002	2003	2004	2005	2006
Lowest:	51	81	51	73	44
Highest:	797	601	660	884	1121
Mean:	276	282	309	306	293
Median:	257	267	294	293	270

Magnesium commercial samples (% of total amount of samples):

	<20	20-65	66-100	101-199	>199	Total
	Very Low	Low	Medium	High	Very High	
2002	0	1	6	27	67	100
2003	0	0	5	19	76	100
2004	0	2	3	15	81	100
2005	0	0	5	21	74	100
2006	0	1	4	27	67	100
Total	0	1	5	24	70	100

9. Iron

9.1 Homeowner Samples

Iron (lbs Fe/acre Morgan extraction) in homeowner samples:

Total number of samples:

	0-49	>49	Total
	Normal	Excessive	
Total	69	9	78

Percentages:

	0-49	>49	Total
	Normal	Excessive	
	88	12	100

	2002-2006
Lowest:	1
Highest:	595
Mean:	33
Median:	9

9.2 Commercial Samples

Iron (lbs Fe/acre Morgan extraction) in commercial samples:

Total number of samples:

	0-49	>49	Total
	Normal	Excessive	
2002	436	19	455
2003	78	5	83
2004	107	2	109
2005	123	10	133
2006	145	12	157
Total	889	48	937

Percentages:

	0-49	>49	Total
	Normal	Excessive	
	96	4	100
	94	6	100
	98	2	100
	92	8	100
	92	8	100
	95	5	100

	2002	2003	2004	2005	2006
Lowest:	1	2	2	1	1
Highest:	299	102	61	122	694
Mean:	17	16	12	20	22
Median:	11	11	8	13	11

10. Manganese

10.1 Homeowner Samples

Manganese (lbs Mn/acre Morgan extraction) in homeowner samples:

Total number of samples:			Percentages:			
	0-99	>99	Total	0-99	>99	Total
	Normal	Excessive		Normal	Excessive	
Total	71	7	78	91	9	100

	2002-2006
Lowest:	11
Highest:	613
Mean:	57
Median:	39

10.2 Commercial Samples

Manganese (lbs Mn/acre Morgan extraction) in commercial samples:

Total number of samples:			Percentages:			
	0-99	>99	Total	0-99	>99	Total
	Normal	Excessive		Normal	Excessive	
2002	453	2	453	100	0	100
2003	81	2	83	98	2	100
2004	109	0	109	100	0	100
2005	132	1	133	99	1	100
2006	157	0	157	100	0	100
Total	932	5	937	99	1	100

	2002	2003	2004	2005	2006
Lowest:	6	10	7	9	5
Highest:	129	101	61	124	79
Mean:	27	36	23	32	27
Median:	26	30	20	29	25

11. Zinc

11.1 Homeowner Samples

Zinc (lbs Zn/acre Morgan extraction) in homeowner samples:

Total number of samples:				Percentages:				
	<0.5	0.5-1.0	>1	Total	<0.5	0.5-1.0	>1	Total
	Low	Medium	High		Low	Medium	High	
Total	4	8	66	78	5	10	85	100

	2002-2006
Lowest:	0.1
Highest:	486.4
Mean:	17.7
Median:	3.3

11.2 Commercial Samples

Zinc (lbs Zn/acre Morgan extraction) in commercial samples:

Total number of samples:				Percentages:				
	<0.5	0.5-1.0	>1	Total	<0.5	0.5-1.0	>1	Total
	Low	Medium	High		Low	Medium	High	
2002	12	69	374	455	3	15	82	100
2003	5	11	67	83	6	13	81	100
2004	9	24	76	109	8	22	70	100
2005	11	32	90	133	8	24	68	100
2006	18	33	106	157	11	21	68	100
Total	55	169	713	937	6	18	76	100

	2002	2003	2004	2005	2006
Lowest:	0.1	0.3	0.1	0.1	0.1
Highest:	147.4	38.8	15.7	8.4	16.7
Mean:	2.7	5.2	1.6	1.7	1.8
Median:	1.7	2.0	1.3	1.4	1.4

Appendix: Cornell Crop Codes

Crop codes are used in the Cornell Nutrient Analyses Laboratory.

Crop Code	Crop Description
Alfalfa	
ABE	Alfalfa trefoil grass, Establishment
ABT	Alfalfa trefoil grass, Established
AGE	Alfalfa grass, Establishment
AGT	Alfalfa grass, Established
ALE	Alfalfa, Establishment
ALT	Alfalfa, Established
Birdsfoot	
BCE	Birdsfoot trefoil clover, Establishment
BCT	Birdsfoot trefoil clover, Established
BGE	Birdsfoot trefoil grass, Establishment
BGT	Birdsfoot trefoil grass, Established
BSE	Birdsfoot trefoil seed, Establishment
BST	Birdsfoot trefoil seed, Established
BTE	Birdsfoot trefoil, Establishment
BTT	Birdsfoot trefoil, Established
Barley	
BSP	Spring barley
BSS	Spring barley with legumes
BUK	Buckwheat
BWI	Winter barley
BWS	Winter barley with legumes
Clover	
CGE	Clover grass, Establishment
CGT	Clover grass, Established
CLE	Clover, Establishment
CLT	Clover, Established
CSE	Clover seed production, Establishment
CST	Clover seed production, Established

Crop Code	Crop Description
	Corn
COG	Corn grain
COS	Corn silage
	Grasses, pastures, covercrops
CVE	Crownvetch, Establishment
CVT	Crownvetch
GIE	Grasses intensively managed, Establishment
GIT	Grasses intensively managed, Established
GRE	Grasses, Establishment
GRT	Grasses, Established
PGE	Pasture, Establishment
PGT	Pasture improved grasses, Established
PIE	Pasture intensively grazed, Establishment
PIT	Pasture intensively grazed, Established
PLE	Pasture with legumes, Establishment
PLT	Pasture with legumes, Established
PNT	Pasture native grasses
RYC	Rye cover crop
RYS	Rye seed production
TRP	Triticale peas
	Small grains
MIL	Millet
OAS	Oats with legume
OAT	Oats
SOF	Sorghum forage
SOG	Sorghum grain
SOY	Soybeans
SSH	Sorghum sudan hybrid
SUD	Sudangrass
WHS	Wheat with legume
WHT	Wheat
	Others
ALG	Azalea
APP	Apples
ATF	Athletic field

Crop Code	Crop Description
BDR/DND	Beans-dry
BLU	Blueberries
CEM	Cemetery
FAR	Fairway
FLA	Flowering annuals
GRA	Grapes
GEN	Green
HRB	Herbs
IDL	Idle land
LAW	Lawn
MIX/MVG	Mixed vegetables
PER	Perennials
PRK	Park
POT/PTO	Potatoes
PUM	Pumpkins
ROD	Roadside
ROS	Roses
RSF	Raspberries, Fall
RSP	Raspberries (homeowners)
RSS	Raspberries, Summer
SAG	Ornamentals adapted to pH 6.0 to 7.5
SQW	Squash, Winter
STE	Strawberries, Ever
STR	Strawberries (homeowners)
STS	Strawberries, Spring
SUN	Sunflowers
SWC	Sweet corn
TOM	Tomatoes
TRE	Christmas trees, Establishment
TRF	Turf
TRT	Christmas trees, Topdressing